EPJ Web of Conferences 2017 vol.132

Phase transitions and exchange interactions in the SmCr3(BO3)4 crystal

Dobretsova E., Boldyrev K., Popova M., Gavrilkin S., Mukhin A., Ivanov V., Mal'tsev V., Leonyuk N., Malkin B.
Kazan Federal University, 420008, Kremlevskaya 18, Kazan, Russia

Abstract

© The Authors, published by EDP Sciences. Spectroscopic investigation and specific heat and magnetic susceptibility measurements of SmCr 3 (BO 3) 4 crystals were performed. The spectra of the Sm 3+ and Cr 3+ ions in samarium chromium borate were calculated and parameters of the exchange interactions between the nearest chromium ions, chromium and samarium ions were determined. Three phase transitions were observed at the temperatures T1= 7.8 ± 0.5 ?, T 2 = 6.7 ± 0.5 ?, and T 3 = 4.3 ± 0.2 ?, their nature is discussed. The crystal structures with different space symmetry groups R32 and C2/c were found to coexist in SmCr 3 (BO 3) 4 single crystal.

http://dx.doi.org/10.1051/epjconf/201713202008

References

[1] E.A. Popova et al., Phys. Rev. B 75, 054446 (2007).
[2] L. Gondek et al., J. Sol. St. Chem. 210, 30 (2014).
[3] K.N. Boldyrev, E.P. Chukalina, N.I. Leonyuk, Phys. Sol. St. 50, 1681 (2008).
[4] M.N. Popova et al., Phys. Rev. B 75, 224435 (2007).